

MODEL 231HC HIGH POWER AMPLIFIER CHARACTERISTICS

Specifications typical at 25°C with forced air at 400 fpm, HV = +160 V. Current mode load = 1.0 mH + 60 mΩ. Capacitor each side to ground 0.47 μF.

Model	Current Mode						
	Output (±A Peak) Pulse Duration / Off time (ms)						
	∞ (DC)	500/500	100/100	10/20	170/1000	25/1000	4/100
231HC	70	85	90	100	100	125	125

PEAK CURRENT SHUTDOWN

130 A

INPUT LIMITER

Adjustable

Current Mode

±15 to ±125 A

SATURATION RESISTANCE

0.05 Ω

GAIN

Adjustable with programmable span

Current Mode

5.38 to 13.88A/V

OUTPUT OFFSET

±25 mA, adjustable to zero

Current Mode Span

0.35 A

INPUT CHARACTERISTICS

Main Input 1

Differential

Impedance

50 kΩ each input to ground, 25kΩ differential

Max Input Voltage

±18V either input or differential

Common Mode Rejection

70 dB min, from DC to 360 Hz

Input 2

Same as Input 1

Gain

Programmable

DC OUTPUT RESISTANCE

Current Mode

2000 Ω

LOAD

Current Mode

1000 μH + 66 mΩ, 0.47 μF each side to ground

Adaptable Range

2 μH to 2.5 H, 0.012 Ω to Open

CURRENT MODE RESPONSE

Small Signal Bandwidth

-3 dB @ 5 kHz

CURRENT SETTLING TIME

Time Reference

End of input ramp

Input Ramp Slope

±100 A/800 μsec

Ramp 0 to ±100 A

200 μsec to within 1.0 A, 1%

350 μsec to within 200 mA, 0.2%

Ramp ±100 A to 0 A

200 μsec to within 1.0 A, 1%

350 μsec to within 200mA, 0.2%

TOTAL HARMONIC DISTORTION

Current Mode

200 Hz, 60 A RMS, 0.2% max

Load

1000 μH + 33 mΩ

MODEL 231HC

DC DRIFT

Current Mode Offset
Self Heating Drift, 0 to ± 60 A
Scale Factor

After 1 hour
1 mA/°C
22 mA/10 minutes maximum
60 ppm/°C

SWITCHING FREQUENCY

Synchronization

81 kHz
Input or output

NOISE OUTPUT

Current Mode

10 Hz to 10 kHz 0.6 mA RMS
10 Hz to 500 Hz 0.4 mA RMS

RIPPLE NOISE OUTPUT

Each Side to Ground
80 V Output, Differential
Current, 0 V Output
Current, 80 V Output

81 kHz
2.5 V RMS max, same phase
2.5 V RMS max
0.4 mA /L RMS
4 mA/L RMS
where L = load inductance in mH

DC POWER SUPPLY SENSITIVITY

Current Mode

0.4 mA/V max

CURRENT MONITOR

Source Resistance

Front & rear D connectors
 ± 1 V/10 A $\pm 1\%$
0.1 Ω

VOLTAGE MONITOR

Source Resistance

Front & rear D connectors
 ± 1 V/20 V $\pm 1\%$
940 Ω

PROGRAMMING HEADER

Accessibility

Sets to Voltage or Current Modes or Fixed Output Resistance. In Current Mode sets gain and response for specific load

Rear panel D connector

REMOTE SHUTDOWN

Switch closure enables output
Selectable ENABLE or INHIBIT
Grounded or optoisolated input
Display Panel **Inhibit** switch must be off

SWITCHES

(on optional display panel) **Inhibit**, with LED, front panel
Reset, also on rear panel

LOAD PROTECTION

Voltage or Current

Adjustable input limiter

Shutdown

Soft Start
Current vs time
All four bridge arms open
To +HV and ground

Diode Clamps

AMPLIFIER PROTECTION

Overload
Current vs Time
Each Heat Sink Temp
Overvoltage Shutdown
Undervoltage Shutdown

Input limiter
Shutdown
Shutdown 87 °C
170 V
40 V

MODEL 231HC

5 V CMOS STATUS OUTPUTS

+5V
CHANNEL ON
NORMAL
FAULT
DC
HOT
OVER-CURRENT
MODULE 1
Maximum Current Output

Fault is Low
HV>20V
Amplifier enabled and operating
Amplifier operates if enabled
Inverted normal
One or more DC voltages out of range
Heat sink over-temperature
Too much current for too long
Module 1 fault
 ± 10 mA

SYNCHRONIZING I/O (81kHz)

Rear D connector

REAR PANEL LED

NORMAL

POWER REQUIREMENTS

High Voltage Supply
Current
Quiescent Current
Internal Capacitance

+50 V to +160 V
See Note 1
0.35 A
13000 μ F

THERMAL REQUIREMENTS

Power Dissipation at 60 A RMS
Peak Dissipation at 85 A
Forced Air 400fpm
Storage

500 W
1000 W
-20 °C to +35 °C
-30 °C to +85 °C

MECHANICAL

Size
Fins & Air Flow
Weight

18.8" L x 9.44" H x 5.1" D
Vertical
18lb, 8 kg